

Appl. No. 09/683,208
Amdt. dated 10/08/2003
Reply to Office action of 04/08/2003

Amendments to the Specification:

Please replace paragraph [0001] with the following amended paragraph:

[0001] This invention relates to an optical seal comparator with which uses the optic optical path formed by combination of splitter mirror, with mirror, and other optic optical accessories, making comparison between pattern of compared seal and that of standard one by projection on the same optic plan optical plane, then through the overlapping process to achieve precise comparison.

Please replace paragraph [0002] with the following amended paragraph:

[0002] It is well known in the art that Seal pattern comparison has based on angle folding or keeping the original pattern on a transparent sheet then covers the chosen one for comparison. The process needs professional personnel with expertise and experiences to conduct the authentication and verification. However, these methods are only available for the comparison of same size of the seal, unavailable for analysis on the detailed trace. This is because the pattern on the top shields the one at the bottom, causing errors due to the unavailability of showing the two patterns on the same [plan] plane. Inevitably, this increases the uncertainty in document authentication process.

Please replace paragraph [0003] with the following amended paragraph:

[0003] The concept of this invention is based upon the character of splitter mirror, making partial penetration and reflection of the image, with mirror to form an optic optical path. Through this optic optical path, the reference of the original seal pattern, and one pattern chosen for comparison, both illuminated by light, and their images are projected to a splitter mirror, respectively, at a 45-degree angle of incidence. By way of, splitter mirror set up in the optic optical path, operator can see through both the seal patterns, one image of pattern chosen for comparison, and one reference image of the original seal pattern, coming out of the splitter mirror. The phenomenon that two images within the equal optical distance to the splitter mirror, appear on the same optic plan optical plane is observable.

Please replace paragraph [0004] with the following amended paragraph:

[0004] Because the reference image reflected from splitter mirror is going through a mirror reflection, it is needed to first have the image go through a mirror, making the formed an erect virtual image, after mirrored twice reflection. Adjustment on the corresponding position between seal pattern and the targeted one for comparison is done so that the two images are overlapped one on the other. If it is a perfect match, there will be only a sole image presented. If the two images are inconsistent, the targeted pattern is then interpreted as not from the original seal. This explains why the two overlapped images, though, presented in the same optic optical plane, can't form a sole image.

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Please replace paragraph [0005] with the following amended paragraph:

[0005] In accordance with the present invention, there is provided a solution of seal comparison on optic plan optical plane, that vanishing parallax in two images of pattern, as a replace for conventional methods of angle folding and sheet covering. For complex pattern precise comparison, a set of magnifiers can be arranged in appropriate positions within the optic optical path. This is for the purpose to magnify two images for detailed trace investigation, meanwhile, make the images presented one on top of the other. Due to the visual residuary effect, flickered image is formed to pinpoint the difference in the overlapping area, therefore, the details on the discrepancy portion, how different it is, and where the difference is, are clearly presented. A fast approach in precise matching of seal patterns and detailed trace analysis is achieved. For personnel who perform seal pattern authentication, recognition, matching, and verification, this is a truly help for them.

Please replace paragraph [0013] with the following amended paragraph:

[0013] Through splitter mirror 50 at an inclined angle of 45 degrees in the optic optical path, operator 92 is able to observe the image of second pattern 66 reflected off splitter mirror 50 as an erect virtual image after being mirrored twice, meanwhile, to see through splitter mirror 50 and observe both images of first pattern 64, second pattern 66 presented on the same optic optical plane. After having the two images overlapped one on top of the other by adjusting corresponding position between first pattern 64 and second pattern 66, if they are consistent, it is the same pattern from the same seal. If they are not, then it comes from a different seal.

Please replace paragraph [0015] with the following amended paragraph:

[0015] Through splitter mirror 50 at an inclined angle of 45 degrees in the optic optical path, operator 92 is able to observe the image of first pattern 64, which has been reflected at splitter mirror 50, it is an erect virtual image mirrored twice and highly-powered magnified. Look at the perspective image of splitter mirror 50 at the same time, which shows the erect virtual image of second pattern 66 highly-powered magnified as well, both images appear in the same optic optical plane, adjusting the relative positions of first pattern 64 and second pattern 66 can overlap the two magnified images.

Please replace paragraph [0017] with the following amended paragraph:

[0017] Through splitter mirror 50 at an inclined angle of 45 degrees and third lens 72 in the optic optical path, operator 92 is able to observe the image of second pattern 66, which has been reflected at splitter mirror 50, it is an erect virtual image mirrored twice and highly-powered magnified. Look at the perspective image of splitter mirror 50 at the same time, which shows the erect virtual image of first pattern 64 highly-powered magnified and mirrored twice as well, both images appear in the same optic optical plane, adjusting the

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relative positions of first pattern 64 and second pattern 66 can overlap the two magnified images.

Please replace paragraph [0019] with the following amended paragraph:

[0019] Through splitter mirror 50 at an inclined angle of 45 degrees in the optic optical path, operator 92 is able to observe the images of first pattern 64 and second pattern 66, which has been reflected at first splitter mirror 52, both of them are magnified erect virtual images mirrored four times and appear in the same optic optical plane, adjusting the relative positions of first pattern 64 and second pattern 66 can overlap the two magnified images.

Please replace paragraph [0020] with the following amended paragraph:

[0020] As far as the optic optical path is concerned, because the images of first pattern 64 and second pattern 66 go through the same optical distance, the focal length of first lens 68 and second lens 70 are the same, the optical distance between first pattern 64 and first lens 68 is same as the optical distance between second pattern 66 and second lens 70. Under those circumstances, there is the same as the ratio of magnification between the image of first pattern 64 magnified through passing first lens 68 with third lens 72 and the image of second pattern 66 magnified through passing second lens 70 with third lens 72. Therefore, third lens 72 or third lens 72 with first mirror 58 can be moved along the optic optical axis between first mirror 58 and second splitter mirror 54 to simultaneously increase the magnifying multiple of the images of first pattern 64 and second pattern 66.

Please replace paragraph [0028] with the following amended paragraph:

[0028] The alternating display for the two patterns is through alternating electronic signal controlling on/off status of first light source 78 and second light source 80 alternatively, or both first light source 78 and second light source 80 are constant on, meanwhile, making on/off status of first liquid crystal panel 88 and second liquid crystal panel 90 opposite against each other. In the process of overlapping, the two images will be the same if there is neither inconsistency nor flickering within images presented. For any existing inconsistency, flickering phenomenon is presented. Operator 92 analyzes and magnifies details of these two images, quickly verifying if these images are of the same or different from each other, in the meantime, finding where the difference is and how different it is. In the optic optical path the direction of polarization between first polarizer 84 and second polarizer 86 is one against to the other in the optic optical path, ensuring independent presentation of each image and avoiding mutual interference, therefore, to enhance the quality of images during comparison by reinforcing the contrast of each image. Furthermore, this is to cooperate with effect by first liquid crystal panel 88 and second liquid crystal panel 90, making alternating image display by controlling status of transparency or opaque of the optic optical path that determines the availability of image display.

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Please replace paragraph [0029] with the following amended paragraph:

[0029] The light source for the patterns is determined by pattern format. Reflection light source is for opaque pattern, whereas, back-light is for transparent one. Reflection light source mainly relies on normal light bulbs. If fast transition between brightness and darkness is necessary, the reaction is sluggish. If equipped with liquid crystal panel and polarizer or switched to discharge lamp, then static and clear dynamic image is presented. Anti-reflection device 62 is a light absorber for avoiding reflected optical noise in the optie optical path.